

# SEQUENCE LISTING

<110> SHEFFIELD, VAL C.  
ALWARD, WALLACE L.M.  
STONE, EDWIN M.  
NISHIMURA, DARRYL  
PATIL, SHIVA

<120> THERAPEUTICS AND DIAGNOSTICS FOR CONGENITAL HEART  
DISEASE BASED ON A NOVEL HUMAN TRANSCRIPTION FACTOR

<130> IOWA:042USD1

<140> 09/612,809

<141> 2000-07-10

<160> 20

<170> PatentIn Ver. 2.1

<210> 1

<211> 2284

<212> DNA

<213> Homo sapiens

<400> 1

```
cgagaaaagg tgacgcgggg cccggggcagg cggccgggcgc gcggccccc cccccccgc 60
cctggttatt tggccgcctt cgcgggcagc tcagggcaga gtctcctgga aggcgcaggc 120
agtgtggcga gaaggggcgc tgcttgttct ttctttttgt ctgctttccc cgtttgcgc 180
ctggaagctg cgccgcgagt tcctgcaagg cggctcgccg cggccggggc cggccttctc 240
ccctgcgagc gacccgcctt cgcggccgcg cgggccccga ggtagcccgga ggcgcggag 300
gagccagccc cagcgagcgc cgggagaggc ggcagcgcag ccggacgcac agcgagcgg 360
gccggcacca gctcggccgg gcccggaact ggactcggcg gccggcgccg cgcggcccg 420
cccgagcgag ggtggggggc ggcggggcgg cggggggcgg ggcgagcggg ggcccacac 480
ctcaaagccg aactaaatcg aaccccaaag caggaaaagc taaaggaacc catcaaggca 540
aatcgaaac taaaaaaaaa aaatccaatt aaaaaaacc cctgagaata ttcaccacac 600
cagcgaaacg aatatccctc caaaaattca gtcaccagc accagcacga agaaaactct 660
atcttcttaa ccgattaatt cagagccacc tccactttgc cttgtctaaa taaacaaacc 720
cgtaaaactgt tttatacaga gacagcaaaa tcttggttta tttaaaggaca gtgttactcc 780
agataacacg taagtttctt cttgcttttc agagacctgc tttcccctcc tcccgctctc 840
cctctcttgc cttcttcctt gcctctcacc tgtaagatat tattttatcc tatgttgaag 900
ggagggggaa agtccccgtt tatgaaagtc gctttctttt tattcatgga cttgttttaa 960
aatgtaaatt gcaacatagt aatttatatt taattttagt ttggatgtcg tggaccaaac 1020
gccagaaaag gtcccaaaa cctgacgtta aattgcctga aactttaaat tgtgcttttt 1080
ttctcattat aaaaaggga actgtattaa tcttattcta tcctcttttc tttctttttg 1140
ttgaacatat tcattgtttg tttattaata aattaccatt cagtttgaat gagacctata 1200
tgtctggata ctttaataga gctttaatta ttacgaaaaa agatttcaga gataaaacac 1260
tagaagttac ctattctcca cctaaatctc tgaaaaatgg agaaaccctc tgactagtcc 1320
atgtcaaat ttactaaaag tctttttgtt tagatttatt ttcctgcagc atcttctgca 1380
aaatgtacta tatagtcagc ttgctttgag gctagtaaaa agatattttt ctaaacagat 1440
tggagttggc atataaaca atacgttttc tctaataga cagtccatga ttcggaaatt 1500
ttaagcccat gaatcagccg cggctctacc acggtgatgc ctgtgtgccg agagatggga 1560
ctgtgcggcc agatatgcac agataaatat ttggcttgtg tattccatat aaaattgcag 1620
tgcataattat acatccctgt gagccagatg ctgaatagat tttttcctat tatttcagtc 1680
ctttataaaa ggaaaaataa accagttttt aaatgtatgt atataattct cccccattta 1740
caatccttca tgtattacat agaaggattg cttttttaaa aatatactgc ggggttgaaa 1800
gggatattta atctttgaga aactatttta gaaaatatgt ttgtagaaca attatttttg 1860
```

```

aaaaagattt aaagcaataa caagaaggaa ggcgagagga gcagaacatt ttggtctagg 1920
gtgggtttctt tttaaaccat tttttcttgt taatttacag ttaaacctag gggacaatcc 1980
ggattggccc tccccctttt gtaaataacc caggaaatgt aataaattca ttatcttagg 2040
gtgatctgcc ctgccaatca gactttgggg agatggcgat ttgattacag acgttcgggg 2100
gggtgggggg cttgcagttt gttttggaga taatacagtt tctgctatc tgccgctcct 2160
atctagaggc aacacttaag cagtaattgc tgttgcttgt tgtcaaaatt tgatcattgt 2220
taaaggattg ctgcaaataa atacacttta atttcagtca aaaaaaaaaa aaaaaaaaaa 2280
aaaa                                           2284

```

```

<210> 2
<211> 553
<212> PRT
<213> Homo sapiens

```

```

<400> 2
Met Gln Ala Arg Tyr Ser Val Ser Ser Pro Asn Ser Leu Gly Val Val
  1              5              10              15

Pro Tyr Leu Gly Gly Glu Gln Ser Tyr Tyr Arg Ala Ala Ala Ala Ala
      20              25              30

Ala Gly Gly Gly Tyr Thr Ala Met Pro Ala Pro Met Ser Val Tyr Ser
      35              40              45

His Pro Ala His Ala Glu Gln Tyr Pro Gly Gly Met Ala Arg Ala Tyr
      50              55              60

Gly Pro Tyr Thr Pro Gln Pro Gln Pro Lys Asp Met Val Lys Pro Pro
      65              70              75              80

Tyr Ser Tyr Ile Ala Leu Ile Thr Met Ala Ile Gln Asn Ala Pro Asp
      85              90              95

Lys Lys Ile Thr Leu Asn Gly Ile Tyr Gln Phe Ile Met Asp Arg Phe
      100             105             110

Pro Phe Tyr Arg Asp Asn Lys Gln Gly Trp Gln Asn Ser Ile Arg His
      115             120             125

Asn Leu Ser Leu Asn Glu Cys Phe Val Lys Val Pro Arg Asp Asp Lys
      130             135             140

Lys Pro Gly Lys Gly Ser Tyr Trp Thr Leu Asp Pro Asp Ser Tyr Asn
      145             150             155             160

Met Phe Glu Asn Gly Ser Phe Leu Arg Arg Arg Arg Arg Phe Lys Lys
      165             170             175

Lys Asp Ala Val Lys Asp Lys Glu Glu Lys Asp Arg Leu His Leu Lys
      180             185             190

Glu Pro Pro Pro Pro Gly Arg Gln Pro Pro Pro Ala Pro Pro Glu Gln
      195             200             205

Ala Asp Gly Asn Ala Pro Gly Pro Gln Pro Pro Pro Val Arg Ile Gln
      210             215             220

```

Asp	Ile	Lys	Thr	Glu	Asn	Gly	Thr	Cys	Pro	Ser	Pro	Pro	Gln	Pro	Leu	225	230	235	240
Ser	Pro	Ala	Ala	Ala	Leu	Gly	Ser	Gly	Ser	Ala	Ala	Ala	Val	Pro	Lys	245	250	255	
Ile	Glu	Ser	Pro	Asp	Ser	Ser	Ser	Ser	Ser	Leu	Ser	Ser	Gly	Ser	Ser	260	265	270	
Pro	Pro	Gly	Ser	Leu	Pro	Ser	Ala	Arg	Pro	Leu	Ser	Leu	Asp	Gly	Ala	275	280	285	
Asp	Ser	Ala	Pro	Pro	Pro	Pro	Ala	Pro	Ser	Ala	Pro	Pro	Pro	His	His	290	295	300	
Ser	Gln	Gly	Phe	Ser	Val	Asp	Asn	Ile	Met	Thr	Ser	Leu	Arg	Gly	Ser	305	310	315	320
Pro	Gln	Ser	Ala	Ala	Ala	Glu	Leu	Ser	Ser	Gly	Leu	Leu	Ala	Ser	Ala	325	330	335	
Ala	Ala	Ser	Ser	Arg	Ala	Gly	Ile	Ala	Pro	Pro	Leu	Ala	Leu	Gly	Ala	340	345	350	
Tyr	Ser	Pro	Gly	Gln	Ser	Ser	Leu	Tyr	Ser	Ser	Pro	Cys	Ser	Gln	Thr	355	360	365	
Ser	Ser	Ala	Gly	Ser	Ser	Gly	Gly	Gly	Gly	Gly	Gly	Ala	Gly	Ala	Ala	370	375	380	
Gly	Gly	Ala	Gly	Gly	Ala	Gly	Thr	Tyr	His	Cys	Asn	Leu	Gln	Ala	Met	385	390	395	400
Ser	Leu	Tyr	Ala	Ala	Gly	Glu	Arg	Gly	Gly	His	Leu	Gln	Gly	Ala	Pro	405	410	415	
Gly	Gly	Ala	Gly	Gly	Ser	Ala	Val	Asp	Asn	Pro	Leu	Pro	Asp	Tyr	Ser	420	425	430	
Leu	Pro	Pro	Val	Thr	Ser	Ser	Ser	Ser	Ser	Ser	Leu	Ser	His	Gly	Gly	435	440	445	
Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gly	Gln	Glu	Ala	Gly	His	His	Pro	Ala	450	455	460	
Ala	His	Gln	Gly	Arg	Leu	Thr	Ser	Trp	Tyr	Leu	Asn	Gln	Ala	Gly	Gly	465	470	475	480
Asp	Leu	Gly	His	Leu	Ala	Ser	Ala	Ala	Ala	Ala	Ala	Ala	Ala	Ala	Gly	485	490	495	
Tyr	Pro	Gly	Gln	Gln	Gln	Asn	Phe	His	Ser	Val	Arg	Glu	Met	Phe	Glu	500	505	510	
Ser	Gln	Arg	Ile	Gly	Leu	Asn	Asn	Ser	Pro	Val	Asn	Gly	Asn	Ser	Ser	515	520	525	

Cys Gln Met Ala Phe Pro Ser Ser Gln Ser Leu Tyr Arg Thr Ser Gly  
 530 535 540

Ala Phe Val Tyr Asp Cys Ser Lys Phe  
 545 550

<210> 3  
 <211> 1662  
 <212> DNA  
 <213> Homo sapiens

<400> 3  
 atgcaggcgc gctactccgt gtccagcccc aactccctgg gagggtgccc ctacctcggc 60  
 ggcgagcaga gctactaccg cgcggcggcc gcggcggccg ggggcggcta caccgccatg 120  
 ccggccccc tgagcgtgta ctgcacccct gcgcacgccg agcagtacct gggcggcatg 180  
 gccgcgcct acggggcccta cagcgcgcag ccgcagccca aggacatggt gaagccgccc 240  
 tatagctaca tcgcgctcat caccatggcc atccagaacg ccccgacaa gaagatcacc 300  
 ctgaacggca tctaccagtt catcatggac cgcttccct tctaccggga caacaagcag 360  
 ggctggcaga acagcatccg ccacaacctc tcgctcaacg agtgcctcgt caaggtgccg 420  
 cgcgacgaca agaagccggg caagggcagc tactggacgc tggaccggga ctctacaac 480  
 atgttcgaga acggcagctt cctgcggcgg cggcggcgt tcaagaagaa ggacgcggtg 540  
 aaggacaagg aggagaagga caggctgcac ctcaaggagc cggcccgccc cggccgccag 600  
 ccccgcccg cgcgcgcgga gcaggccgac ggcaacgcgc cgggtccgca gccgcgccc 660  
 gtgcgcatcc aggacatcaa gaccgagaac ggtacgtgcc cctcgccgccc ccagccccctg 720  
 tccccggccg ccgccctggg cagcggcagc gccgcgcggt tggccaagat cgagagcccc 780  
 gacagcagca gcagcagcct gtccagcggg agcagccccc cgggcagcct gccgtcggcg 840  
 cggccgctca gcttgacgg tgccgattcc gcgcgcgcgc cggccgcgccc ctccgccccg 900  
 ccgcgcacc atagccaggg ctccagcgtg gacaacatca tgacgtcgt gcgggggtcg 960  
 ccgcagagcg cggccgcgga gctcagctcc ggccttctgg cctcgggcgc cgcgtcctcg 1020  
 cgcgcgggga tcgcaccccc gctggcgctc ggcgcctact cggccggcca gagtcctctc 1080  
 tacagctccc cctgcagcca gacctccagc gcgggcagct cgggcggcgg cggcgggcgc 1140  
 gcgggggccc cggggggcgc gggcggcgccc gggacctacc actgcaacct gcaagccatg 1200  
 agcctgtacg cggccggcga gcgcgggggc cacttgacag gcgcgcccgg gggcgcgggc 1260  
 ggctcggccg tggacaaccc cctgcccagc tactctctgc ctccggtcac cagcagcagc 1320  
 tcgtcgtccc tgagtcacgg cggcggcggc ggcggcgggc ggggaggcca ggaggccggc 1380  
 caccaccctg cggcccaacca aggcgcctc acctcgtggt acctgaacca ggcgggcgga 1440  
 gacctgggccc acttggaag cgcggcgggc gcggcgggcg ccgcaggcta cccgggcccag 1500  
 cagcagaact tccactcggg gcgggagatg ttcgagtcac agaggatcgg cttgaacaac 1560  
 tctccagtga acgggaatag tagctgtcaa atggccttcc cttccagcca gtctctgtac 1620  
 cgcacgtccg gagctttcgt ctacgactgt agcaagtttt ga 1662

<210> 4  
 <211> 106  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic Peptide

<400> 4  
 Pro Lys Asp Met Val Lys Pro Pro Tyr Ser Tyr Ile Ala Leu Ile Thr  
 1 5 10 15

Met Ala Ile Gln Asn Ala Pro Asp Lys Lys Ile Thr Leu Asn Gly Ile  
20 25 30

Tyr Gln Phe Ile Met Asp Arg Phe Pro Phe Tyr Arg Asp Asn Lys Gln  
35 40 45

Gly Trp Gln Asn Ser Ile Arg His Asn Leu Ser Leu Asn Glu Cys Phe  
50 55 60

Val Lys Val Pro Arg Asp Asp Lys Lys Pro Gly Lys Gly Ser Tyr Trp  
65 70 75 80

Thr Leu Asp Pro Asp Ser Tyr Asn Met Phe Glu Asn Gly Ser Phe Leu  
85 90 95

Arg Arg Arg Arg Arg Phe Lys Lys Lys Asp  
100 105

<210> 5  
<211> 106  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 5  
Pro Lys Asp Leu Val Lys Pro Pro Tyr Ser Tyr Ile Ala Leu Ile Thr  
1 5 10 15

Met Ala Ile Gln Asn Ala Pro Glu Lys Lys Ile Thr Leu Asn Gly Ile  
20 25 30

Tyr Gln Phe Ile Met Asp Arg Phe Pro Phe Tyr Arg Glu Asn Lys Gln  
35 40 45

Gly Trp Gln Asn Ser Ile Arg His Asn Leu Ser Leu Asn Glu Cys Phe  
50 55 60

Val Lys Val Pro Arg Asp Asp Lys Lys Pro Gly Lys Gly Ser Tyr Trp  
65 70 75 80

Thr Leu Asp Pro Asp Ser Tyr Asn Met Phe Glu Asn Gly Ser Phe Leu  
85 90 95

Arg Arg Arg Arg Arg Phe Lys Lys Lys Asp  
100 105

<210> 6  
<211> 106  
<212> PRT  
<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 6

Thr Thr Glu Pro Thr Lys Pro Pro Tyr Ser Tyr Ile Ala Leu Ile Ala  
1 5 10 15

Met Ala Ile Gln Ser Ser Pro Gly Gln Arg Ala Thr Leu Ser Gly Ile  
20 25 30

Tyr Arg Val Ile Met Gly Arg Phe Ala Phe Tyr Arg His Asn Arg Pro  
35 40 45

Gly Trp Gln Asn Ser Ile Arg His Asn Leu Ser Leu Asn Glu Cys Phe  
50 55 60

Val Lys Val Pro Arg Asp Asp Arg Lys Pro Gly Lys Gly Ser Tyr Trp  
65 70 75 80

Thr Leu Asp Pro Asp Cys His Asp Met Phe Glu His Gly Ser Phe Leu  
85 90 95

Arg Arg Arg Arg Arg Phe Thr Arg Gln Thr  
100 105

<210> 7

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic Peptide

<400> 7

Ala Glu Thr Pro Gln Lys Pro Pro Tyr Ser Tyr Ile Ala Leu Ile Ala  
1 5 10 15

Met Ala Ile Gln Asp Ala Pro Glu Gln Arg Val Thr Leu Asn Gly Ile  
20 25 30

Tyr Gln Phe Ile Met Asp Arg Phe Pro Phe Tyr His Asp Asn Arg Gln  
35 40 45

Gly Trp Gln Asn Ser Ile Arg His Asn Leu Ser Leu Asn Asp Cys Phe  
50 55 60

Val Lys Val Pro Arg Glu Lys Gly Arg Pro Gly Lys Gly Ser Tyr Trp  
65 70 75 80

Thr Leu Asp Pro Arg Cys Leu Asp Met Phe Glu Asn Gly Asn Tyr Arg  
85 90 95

Arg Arg Lys Arg Lys Pro Lys Pro Gly Pro  
100 105

<210> 8  
<211> 106  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 8  
Pro Leu Gln Arg Gly Lys Pro Pro Tyr Ser Tyr Ile Ala Leu Ile Ala  
1 5 10 15  
Met Ala Leu Ala His Ala Pro Gly Arg Arg Leu Thr Leu Ala Ala Ile  
20 25 30  
Tyr Arg Phe Ile Thr Glu Arg Phe Ala Phe Tyr Arg Asp Ser Pro Arg  
35 40 45  
Lys Trp Gln Asn Ser Ile Arg His Asn Leu Thr Leu Asn Asp Cys Phe  
50 55 60  
Val Lys Val Pro Arg Glu Pro Gly Asn Pro Gly Lys Gly Asn Tyr Trp  
65 70 75 80  
Thr Leu Asp Pro Ala Ala Ala Asp Met Phe Asp Asn Gly Ser Phe Leu  
85 90 95  
Pro Arg Arg Lys Arg Phe Lys Arg Ala Glu  
100 105

<210> 9  
<211> 106  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 9  
Pro Leu Gln Arg Gly Lys Pro Pro Tyr Ser Tyr Ile Ala Leu Ile Ala  
1 5 10 15  
Met Ala Ile Ala His Ala Pro Glu Arg Arg Leu Thr Leu Gly Gly Ile  
20 25 30  
Tyr Lys Phe Ile Thr Glu Arg Phe Pro Phe Tyr Arg Asp Asn Pro Lys  
35 40 45  
Lys Trp Gln Asn Ser Ile Arg His Asn Leu Thr Leu Asn Asp Cys Phe  
50 55 60  
Leu Lys Ile Pro Arg Glu Ala Gly Arg Pro Gly Lys Gly Asn Tyr Trp  
65 70 75 80

Ala Leu Asp Pro Asn Ala Glu Asp Met Phe Glu Ser Gly Ser Phe Leu  
85 90 95

Arg Arg Arg Lys Arg Phe Lys Arg Ser Asp  
100 105

<210> 10  
<211> 106  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 10  
Ala Arg Gln Pro Ala Lys Pro Pro Ser Ser Tyr Ile Ala Leu Ile Thr  
1 5 10 15

Met Ala Ile Leu Gln Ser Pro His Lys Arg Leu Thr Leu Ser Gly Ile  
20 25 30

Cys Ala Phe Ile Ser Asp Arg Phe Pro Tyr Tyr Arg Arg Lys Glu Pro  
35 40 45

Gly Trp Gln Asn Ser Ile Arg His Asn Leu Ser Leu Asn Asp Cys Phe  
50 55 60

Val Lys Ile Pro Arg Glu Pro Gly Arg Pro Gly Lys Gly Asn Tyr Trp  
65 70 75 80

Ser Leu Asp Pro Ala Ser Gln Asp Met Phe Asp Asn Gly Ser Phe Leu  
85 90 95

Arg Arg Arg Lys Arg Phe Gln Arg Asn Gln  
100 105

<210> 11  
<211> 106  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 11  
Arg Thr Arg Leu Val Lys Pro Pro Tyr Ser Tyr Ile Ala Leu Ile Thr  
1 5 10 15

Met Ala Ile Leu Gln Ser Pro Lys Lys Arg Leu Thr Leu Ser Glu Ile  
20 25 30

Cys Glu Phe Ile Ser Gly Arg Phe Pro Tyr Tyr Arg Glu Lys Phe Pro



35

40

45

Ala Trp Gln Asn Ser Ile Arg His Asn Leu Ser Leu Asn Asp Cys Phe  
 50 55 60

Val Lys Ile Pro Arg Glu Pro Gly Asn Pro Gly Lys Gly Asn Tyr Trp  
 65 70 75 80

Thr Leu Asp Pro Glu Ser Ala Asp Met Phe Asp Asn Gly Ser Phe Leu  
 85 90 95

Arg Arg Arg Lys Arg Phe Lys Arg Gln Pro  
 100 105

&lt;210&gt; 12

&lt;211&gt; 106

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
 Peptide

&lt;400&gt; 12

Arg Ser Pro Leu Val Lys Pro Pro Tyr Ser Tyr Ile Ala Leu Ile Thr  
 1 5 10 15

Met Ala Ile Leu Gln Ser Pro Lys Lys Arg Leu Thr Leu Ser Glu Ile  
 20 25 30

Cys Glu Phe Ile Ser Gly Arg Phe Pro Tyr Tyr Arg Glu Lys Phe Pro  
 35 40 45

Ala Trp Gln Asn Ser Ile Arg His Asn Leu Ser Leu Asn Asp Cys Phe  
 50 55 60

Val Lys Ile Pro Arg Glu Pro Gly Asn Pro Gly Lys Gly Asn Tyr Trp  
 65 70 75 80

Thr Leu Asp Pro Glu Ser Ala Asp Met Phe Asp Asn Gly Ser Phe Leu  
 85 90 95

Arg Arg Lys Arg Arg Phe Lys Arg Gln Pro  
 100 105

&lt;210&gt; 13

&lt;211&gt; 106

&lt;212&gt; PRT

&lt;213&gt; Artificial Sequence

&lt;220&gt;

<223> Description of Artificial Sequence: Synthetic  
 Peptide

&lt;400&gt; 13

Ile	Arg	Arg	Pro	Glu	Lys	Pro	Pro	Tyr	Ser	Tyr	Ile	Ala	Leu	Ile	Val
1				5					10					15	
Met	Ala	Ile	Gln	Ser	Ser	Pro	Thr	Lys	Arg	Leu	Thr	Leu	Ser	Glu	Ile
			20					25					30		
Tyr	Gln	Phe	Leu	Gln	Ser	Arg	Phe	Pro	Phe	Phe	Arg	Gly	Ser	Tyr	Gln
		35					40					45			
Gly	Trp	Lys	Asn	Ser	Val	Arg	His	Asn	Leu	Ser	Leu	Asn	Glu	Cys	Phe
	50					55					60				
Ile	Lys	Leu	Pro	Lys	Gly	Leu	Gly	Arg	Pro	Gly	Lys	Gly	His	Tyr	Trp
65					70					75					80
Thr	Ile	Asp	Pro	Ala	Ser	Glu	Phe	Met	Phe	Glu	Asn	Gly	Ser	Phe	Arg
				85					90					95	
Arg	Arg	Arg	Arg	Gly	Phe	Arg	Arg	Lys	Cys						
			100					105							

<210> 14  
 <211> 106  
 <212> PRT  
 <213> Artificial Sequence

<220>  
 <223> Description of Artificial Sequence: Synthetic Peptide

Leu	Arg	Arg	Pro	Glu	Lys	Pro	Pro	Tyr	Ser	Tyr	Ile	Ala	Leu	Ile	Val
1				5					10					15	
Met	Ala	Ile	Gln	Ser	Ser	Pro	Ser	Lys	Arg	Leu	Thr	Leu	Ser	Glu	Ile
			20					25					30		
Tyr	Gln	Phe	Leu	Gln	Ala	Arg	Phe	Pro	Phe	Phe	Arg	Gly	Ala	Tyr	Gln
		35					40					45			
Gly	Trp	Lys	Asn	Ser	Val	Arg	His	Asn	Leu	Ser	Leu	Asn	Glu	Cys	Phe
	50					55					60				
Ile	Lys	Leu	Pro	Lys	Gly	Leu	Gly	Arg	Pro	Gly	Lys	Gly	His	Tyr	Trp
65					70					75					80
Thr	Ile	Asp	Pro	Ala	Ser	Glu	Phe	Met	Phe	Glu	Asn	Gly	Ser	Phe	Arg
				85					90					95	
Arg	Arg	Arg	Arg	Gly	Phe	Arg	Arg	Lys	Cys						
			100					105							

<210> 15  
 <211> 106  
 <212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 15

Asn Gly Lys Tyr Glu Lys Pro Pro Phe Ser Tyr Asn Ala Leu Ile Met  
1 5 10 15

Met Ala Ile Arg Gln Ser Pro Glu Lys Arg Leu Thr Leu Asn Gly Ile  
20 25 30

Tyr Glu Phe Ile Met Lys Asn Phe Pro Tyr Tyr Arg Glu Asn Lys Gln  
35 40 45

Gly Trp Gln Asn Ser Ile Arg His Asn Leu Ser Leu Asn Lys Cys Phe  
50 55 60

Val Lys Val Pro Arg His Tyr Asp Asp Pro Gly Lys Gly Asn Tyr Trp  
65 70 75 80

Met Leu Asp Pro Ser Ser Tyr Asp Asp Val Ile Gly Gly Thr Thr Gly  
85 90 95

Lys Leu Arg Arg Arg Ser Thr Thr Ser Pro  
100 105

<210> 16

<211> 106

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 16

Asn Gly Lys Tyr Glu Lys Pro Pro Phe Ser Tyr Asn Ala Leu Ile Met  
1 5 10 15

Met Ala Met Arg Gln Ser Pro Glu Lys Arg Leu Thr Leu Asn Gly Ile  
20 25 30

Tyr Glu Phe Ile Met Lys Asn Phe Pro Tyr Tyr Arg Glu Asn Lys Gln  
35 40 45

Gly Trp Gln Asn Ser Ile Arg His Asn Leu Ser Leu Asn Lys Cys Phe  
50 55 60

Val Lys Val Pro Arg His Tyr Asp Asp Pro Gly Lys Gly Asn Tyr Trp  
65 70 75 80

Met Leu Asp Pro Ser Ser Tyr Asp Asp Val Ile Gly Gly Thr Thr Gly  
85 90 95

Lys Leu Arg Arg Ser Thr Thr Ser Pro Ala  
100 105

<210> 17  
<211> 106  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 17  
Gly Lys Tyr Glu Lys Pro Pro Pro Phe Ser Tyr Asn Ala Leu Ile Met  
1 5 10 15  
Met Ala Ile Arg Gln Ser Pro Glu Lys Arg Leu Thr Leu Asn Gly Ile  
20 25 30  
Tyr Glu Phe Ile Met Lys Asn Phe Pro Tyr Tyr Arg Glu Asn Lys Gln  
35 40 45  
Gly Trp His Asn Ser Ile Arg Asp Asn Leu Ser Leu Asn Lys Cys Phe  
50 55 60  
Val Lys Val Pro Arg His Tyr Asp Asp Pro Gly Lys Gly Asn Tyr Trp  
65 70 75 80  
Met Leu Asp Pro Ser Ser Asp Asp Val Phe Ile Gly Gly Thr Thr Gly  
85 90 95  
Lys Leu Arg Arg Arg Ser Thr Thr Ser Arg  
100 105

<210> 18  
<211> 76  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 18  
Leu Met Lys Leu Val Arg Pro Pro Tyr Ser Tyr Ser Ala Leu Ile Ala  
1 5 10 15  
Met Ala Ile His Gly Ala Pro Asp Lys Arg Leu Thr Leu Ser Gln Ile  
20 25 30  
Tyr Gln Tyr Val Ala Asp Asn Phe Pro Phe Tyr Asn Lys Ser Lys Ala  
35 40 45  
Gly Trp Gln Asn Ser Ile Arg His Asn Leu Ser Leu Asn Asp Cys Phe  
50 55 60

Lys Lys Val Pro Arg Asp Glu Asp Asp Pro Gly Lys  
65 70 75

<210> 19  
<211> 106  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 19  
Thr Asn Pro His Val Lys Pro Pro Tyr Ser Tyr Ala Thr Leu Ile Cys  
1 5 10 15  
Met Ala Met Gln Ala Ser Lys Ala Thr Lys Ile Thr Leu Ser Ala Ile  
20 25 30  
Tyr Lys Trp Ile Thr Asp Asn Phe Cys Tyr Phe Arg His Ala Asp Pro  
35 40 45  
Thr Trp Gln Asn Ser Ile Arg His Asn Leu Ser Leu Asn Lys Cys Phe  
50 55 60  
Ile Lys Val Pro Arg Glu Lys Asp Glu Pro Gly Lys Gly Gly Phe Trp  
65 70 75 80  
Arg Ile Asp Pro Gln Tyr Ala Glu Arg Leu Leu Ser Gly Ala Phe Lys  
85 90 95  
Lys Arg Arg Leu Pro Phe Val His Ile His  
100 105

<210> 20  
<211> 98  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
Peptide

<400> 20  
Trp Gly Asn Leu Ser Tyr Ala Asp Leu Ile Thr Lys Ala Ile Glu Ser  
1 5 10 15  
Ser Ala Glu Lys Arg Leu Thr Leu Ser Gln Ile Tyr Glu Trp Met Val  
20 25 30  
Lys Ser Val Pro Tyr Phe Lys Asp Lys Gly Asp Ser Asn Ser Ser Ala  
35 40 45  
Gly Trp Gln Lys Ser Ile Arg His Asn Leu Ser Leu His Ser Lys Phe

50

55

60

Ile Arg Val Gln Asn Glu Gly Thr Gly Lys Ser Ser Trp Trp Met Leu  
65 70 75 80

Asn Pro Glu Gly Gly Lys Ser Gly Lys Ser Pro Arg Arg Ala Ala Ser  
85 90 95

Met Asp